UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,562	09/23/2003	Jose A. Tierno	YOR920030375US1	3065

7590 10/31/2006	EXAMINER
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ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	10/668,562	TIERNO, JOSE A.
	Examiner	Art Unit	
	Leila Malek	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 September 2003</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-23</u> is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-23</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09/23/2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date <u>02/19/2004</u>.

4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statement (IDS) submitted on 02/19/2004 has been

considered and made of record by the examiner.

Claim Objections

2.   Claims 6 and 16 are objected to because of the following informalities: as to

claims 6 and 16, "a validation threshold" needs to be replaced by "to a validation

threshold". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7 and 17 are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the enablement requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to enable one skilled in the art to

which it pertains, or with which it is most nearly connected, to make and/or use the

invention. As to claims 7 and 17, applicant fails to describe varying the eye center

threshold to determine the validity of the at least one generated sampling in a way to

enable one ordinary skill in the art to use the same method.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1, 3, 9-11, 13, 19-23 are rejected under 35 U.S.C. 102(b) as being

anticipated by Ariyavisitakul et al. (hereafter, referred as Ariyavisitakul) (US 5,222,101) .

As to claim 1, Ariyavisitakul discloses a method of equalizing (see Fig. 1 and

column 1, last paragraph) an input signal 101 received from a communication channel,

comprising the steps of: generating at least one sampling from the received input signal

based on a clock signal (see block 104 and column 10 last paragraph) (i.e. inherently by

using a clock signal); and compensating for distortion associated with the

communications channel based on at least a portion of the at least one generated

sampling (see the abstract, lines 3-5). Ariyavisitakul further discloses that the clock of

the transmitter (interpreted as the clock used for data recovery) is different than the

clock of the receiver (interpreted as the clock used for sampling purposes) (see column

12, lines 21 and 22).

As to claim 11, Ariyavisitakul discloses an apparatus (see Fig. 1) for equalizing

an input signal 101 received from a communication channel (see column 10, last

paragraph), comprising: a memory 105; and at least one processor coupled to the

memory and operative to: (i) generate at least one sampling from the received input

signal (see block 104 and column 10 last paragraph) (i.e. inherently by using a clock

signal); and (ii) compensate for distortion associated with the communications channel

based on at least a portion of the at least one generated sampling (see the abstract,

lines 3-5). Ariyavisitakul further discloses that the clock of the transmitter (interpreted as

the clock used for data recovery) is different than the clock of the receiver (interpreted as the clock used for sampling purposes) (see column 12, lines 21 and 22).

As to claims 3 and 13, Ariyavisitakul further discloses that the distortion compensating further comprises: setting one or more parameter values based on the at least a portion of the at least one generated sampling (see Fig. 1, block 106, column 10, last paragraph and column 9, lines 33-35); and applying the one or more parameter values to the received input signal (see column 9, lines 35-38).

As to claims 9 and 19, Ariyavisitakul discloses that the communication channel is a digital communications channel (see the abstract and column 1, second paragraph).

As to claims 10 and 20, Ariyavisitakul discloses that the equalization is performed in accordance with a data receiver coupled to the communications channel (see column 10, last paragraph and the abstract).

As to claim 21, Ariyavisitakul discloses an equalization system responsive to an input signal received from a communication channel (see Fig. 1), comprising: a sampling module, the sampling module 104 (see column 10, last paragraph) generating at least one sampling from the received input signal (i.e. inherently by using a clock signal); and a filter (equalizer 107), the filter compensating for distortion associated with the communication channel based (see the abstract and column 10, last paragraph and column 1, lines 33-38) on an equalization algorithm which is responsive to at least a portion of the at least one sampling generated by the sampling module (see the abstract, lines 3-5). Ariyavisitakul further discloses that the clock of the transmitter (interpreted as the clock used for data recovery) is different than the clock of the

receiver (interpreted as the clock used for sampling purposes) (see column 12, lines 21 and 22).

As to claim 22, Ariyavisitakul further shows that the equalization system is part of a data receiver (see Fig. 1).

As to claim 23, Ariyavisitakul discloses that the equalization system is independent of a clock and data recovery system of the data receiver (i.e. the clock used for the equalization system is the receiver clock and is different than the clock used for the data recovery which is the transmitter clock) (see column 12, lines 21 and 22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ariyavisitakul, in view of Hsu et al. (hereafter, referred as Hsu) (US 2004/0062329).

As to claims 2 and 12, Ariyavisitakul discloses that demodulator 104 oversamples the IF signal at a multiple of the symbol rate since optimum time for sampling the signal is unknown. Ariyavisitakul is silent in disclosing that the sampling (oversampling) generation step comprises the steps of: generating multiple phases of the sampling clock signal; and sampling the received input signal at the respective multiple phases of the sampling clock signal to generate respective multiple samples.

Hsu, in the same field of endeavor, discloses an apparatus (see Fig. 1) comprising an

oversampler 24 that samples the data using multiple clocks 26, producing 4 sampled

signals. Hsu further discloses that the clocks are generated by a VCO 30 and are clocks

of the same frequency and four different phases (see paragraph 0003). It would have

been obvious to one of ordinary skill in the art at the time of invention to use multiple

phases of a sampling clock to sample the input signal and determine the optimum clock

for sampling the incoming data (see paragraph 0003) as suggested by Hsu.

6.   Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ariyavisitakul, in view of Dally et al. (hereafter, referred as Dally) (US 2003/0086339).

As to claims 4 and 14, Ariyavisitakul is silent in disclosing that the sampling clock

signal has a lower frequency than the data recovery clock signal. Dally, in the same field

of endeavor, discloses a clock recovery circuit wherein the sample clock is slower

(interpreted as having lower frequency) than the data clock (see paragraph 0060). It

would have been obvious to one of ordinary skill in the art at the time of invention to

make the sample clock slower than the data clock to maintain the synchronization

between two clocks (data clock and sample clock) as suggested by Dally (see

paragraph 0061) and recover the data.

7.   Claims 5, 6, 8, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Ariyavisitakul, in view of Shattil (US 2004/0243258).

As to claims 5 and 15, Ariyavisitakul discloses all the subject matters claimed in

claims 1 and 11, except for validating the at least one generated sampling. Shattil

discloses a receiver (see Fig. 10) comprising: a sampler 1002 to provide samples to

selector 1004, wherein the selector provides weights to the samples (interpreted as validating the samples) (see paragraph 0124). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Ariyavisitakul as suggested by Shattil to select only samples which their power levels meet a predetermined threshold to enhance the integrity of the output signal.

As to claims 6 and 16, Shattil further discloses comparing samples of the at least one generated sampling to a validation threshold (see paragraph 0124). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Ariyavisitakul as suggested by Shattil to select only samples which their power levels meet a predetermined threshold to enhance the integrity of the output signal.

As to claims 8 and 18, Shattil further discloses discarding samples of the at least one generated sampling that are determined to be invalid (see paragraph 0124). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Ariyavisitakul as suggested by Shattil to enhance the integrity of the output signal.

8.   Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ariyavisitakul and Shattil, further in view of Best et al. (hereafter, referred as Best) (US 6,570,944).

As to claims 7 and 17, Ariyavisitakul and Shattil disclose all the subject matters claimed in claims 5 and 15, except for generating leading edge samples and trailing edge samples from the received input signal; and varying an eye center threshold to determine the validity of the at least one generated sampling. Best, in the same field of

endeavor, disclose an apparatus that reduces sampling errors for data communicated

between devices (see the abstract). Best disclose that in any high-speed signaling

system, the ability of the receiving device to sample the data signal at a precise instant

within the valid data interval (the "data eye") is often a critical factor in determining how

brief the data eye may be. Best further discloses that any technique for more accurately

controlling the sampling instant within the data eye generally permits faster data transfer

and therefore higher signaling bandwidth. Best further shows generating leading edge

samples and trailing edge samples from the received input signal (see Fig. 2) and

delaying the signal so that the delayed signal transitions at the midpoint of the data eye

(interpreted as varying an eye center threshold to determine the validity of the at least

one generated sampling).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Leila Malek whose telephone number is 571-272-8731.

The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

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Leila Malek
Examiner
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SUPERVISORY PATENT EXAMINER